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## THE GEOGRAPHIC PATTERN OF TUBERCULOSIS IN NORTH CAROLINA

by

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### I. INTRODUCTION

In 1918, there were 3,514 cases of tuberculosis (TB) in North Carolina, which is a case rate of 139.34 per 100,000 population (1). There were also 3,412 deaths from TB for a death rate of 135.30 (2). The case rate of TB has gone down considerably, however, as in 1982 it was 13.5 per 100,000 population (3). Furthermore, only 63 people died from TB in 1982 for a death rate of 1.05 per 100,000 population (4). Despite the decline in the number of cases, TB is still a serious public health problem in North Carolina. The state's case rate ranked 12th highest in the U.S. in 1982 (5). What is even more perplexing, however, is the preponderance of TB in eastern North Carolina. The map in Figure 1 clearly shows this strong geographic pattern of county morbidity rates for TB.

The major objectives of this paper are:

- 1) to summarize the current morbidity and health care delivery data on TB in North Carolina;
- 2) to provide indicators why an eastern band of counties has more than triple the TB morbidity rate of the rest of the state;
- 3) to see if the counties with high TB rates have high rates throughout the county or just in certain parts of the county;
- 4) to expand the study area and see if Virginia and South Carolina also have this eastern band of counties with a high incidence of TB.

### II. BACKGROUND

The primary cause of TB is a bacterium called the tubercle bacillus (*mycobacterium tuberculosis*).

Infection occurs through the inhalation of the organisms present in the air or droplet nuclei expelled by the coughing or sneezing of a person with active TB. The measurable manifestation of infection is a positive tuberculin skin test; however, signs and symptoms of TB may be absent. Once infected, the person's immune system usually proves adequate to limit the multiplication and spread of the bacilli. Around 5% of newly infected individuals, though, do develop TB disease within a year of their infection (6). If the bacilli produces TB in the lung, then the disease is called pulmonary TB. All other sites of TB are called extra-pulmonary TB.

Vague general symptoms such as fatigue, nervous irritability, or anorexia usually signal the onset of pulmonary TB (7). Later symptoms include a cough, a cold, blood spitting, unexplained fever and night sweats, loss of weight and swollen glands (8). The symptoms for extra-pulmonary TB depend upon where the TB develops.

Approximately 85% of the reported cases of TB in the U.S. are pulmonary TB (9). It is much more a public health problem than extra-pulmonary TB since it usually is more contagious. In pulmonary TB, a cavity is frequently formed in the lung and large numbers of virulent bacilli are released from this cavity daily. Pulmonary TB, however, is not a highly infectious disease when compared to other diseases since transmission usually requires close, frequent, or prolonged exposure (10).

Among persons infected with the tubercle bacillus, only about 5-10% ever develop TB disease (11). However, because the organisms remain viable within the body for decades, the risk of disease is lifelong. The precise factors that determine whether any infected individual will